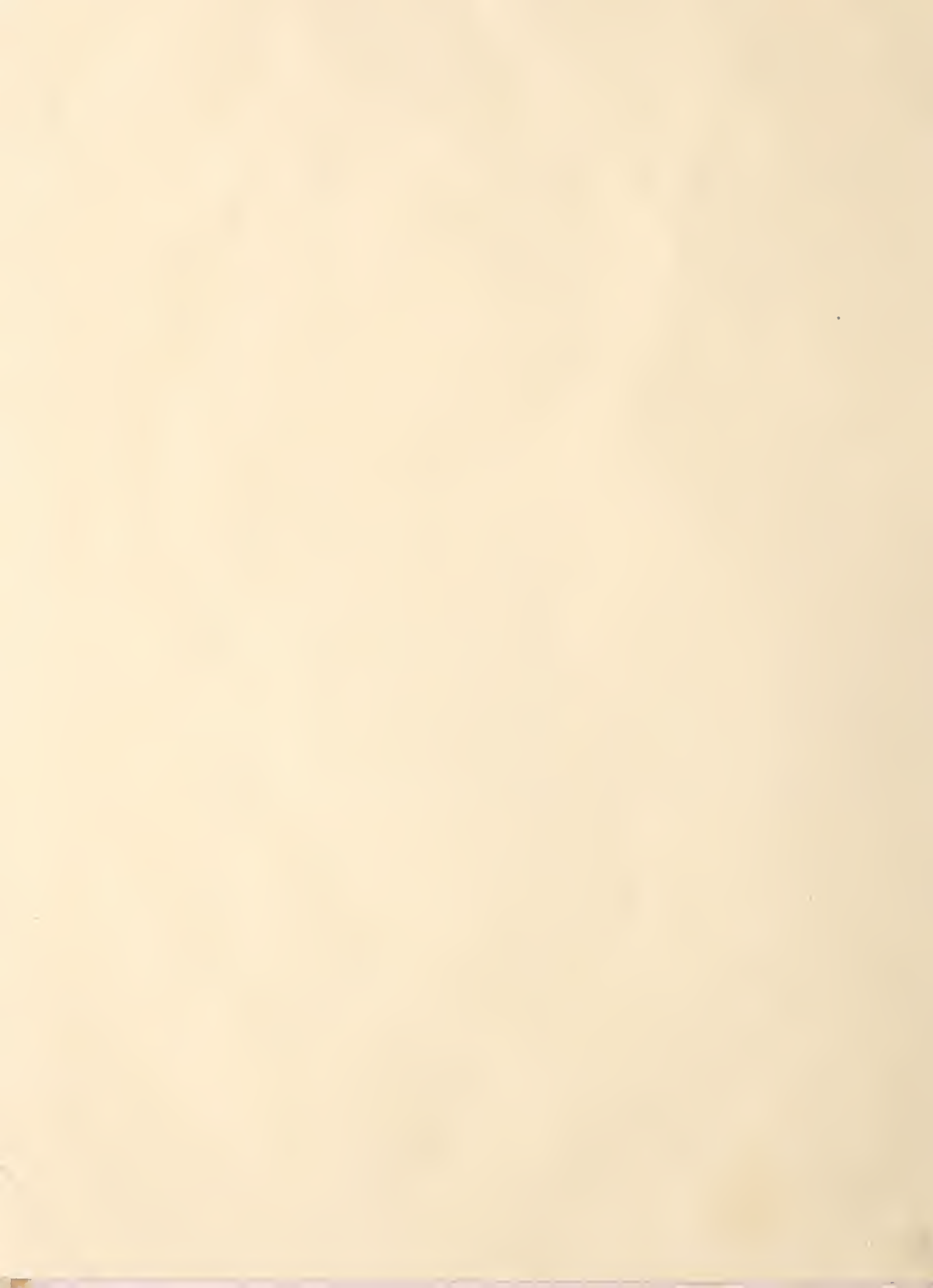


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TOBACCO FOR THE WORLD

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FRONT COVER

Tobacco for the World

About a quarter of the tobacco grown on the farms of America finds its market abroad. Foreign buyers generally get their tobacco at such U. S. auctions as this one in eastern North Carolina. (Photo courtesy of North Carolina News Bureau.)

BACK COVER

Exports of U. S. Leaf Tobaccos

The United Kingdom, the most important buyer of United States tobacco, has been taking increasing quantities of leaf from Commonwealth countries in the past quarter century.

NEWS NOTES

U. S. Foreign Agricultural Policy

The United States should have a new, more realistic foreign trade policy, based on long-time objectives and serving the welfare both of American agriculture and the entire American public.

This recommendation was made recently by Secretary of Agriculture Ezra Taft Benson in a policy statement based on discussions with a 13-member Advisory Committee on Foreign Agricultural Trade and Technical Assistance.

The Secretary pointed to the gravity of today's foreign marketing situation in which, on the one hand, exports of American farm products are dropping and, on the other, the importing of farm products is becoming an increasingly controversial question.

"There is immediate need," he said, "for turning the national spotlight on the complex but urgent problems of international trade. Therefore, we wish to give our strongest support to the President's proposal that a bipartisan commission be created to review and make recommendations on the subject by early 1954."

The Secretary pointed to the multiple problems now standing in the way of expanded agricultural trade, some at home, some abroad. They include such factors as import quotas and embargoes, currency exchange restrictions, and conflicts between domestic farm programs and foreign trade programs.

There are some immediate steps that the United States can take to expand its trade in agricultural products, he believes. One would be to simplify our customs procedures. Another would be to aim at eventual restoration of currency convertibility. Also, we should encourage conditions abroad that are favorable to private investment. And we should take better advantage of credit facilities, such as the Export-Import Bank, in moving agricultural commodities. At the same time there should be maintained a strong Foreign Agricultural Service to keep American agriculture currently informed of foreign agricultural developments affecting it.

As a long-time recommendation, Secretary Benson strongly favors the extending of technical assistance to other countries to help improve their economies and purchasing power. In agricultural aspects of this work, he believes, the Department of Agriculture and the State land-grant colleges and universities should play a leading role.

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FOREIGN AGRICULTURE

ALICE FRAY NELSON, EDITOR

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United States Tobacco In World Trade

by J. B. HUTSON



Changes in world consumption of tobacco and in consumer preferences are of great importance to most United States tobacco growers, for exports make up a substantial part of their sales. About one-third of the flue-cured leaf produced in this country is exported, as well as about one-half of the fire-cured leaf, about 20 percent of the Maryland, 5 to 6 percent of the Burley, 20 to 25 percent of the dark air-cured, and about 5 percent of the cigar leaf.

In the past 20 years total world consumption of manufactured tobacco products outside the U.S.S.R. has increased about 25 percent, largely because of population increases, but also because people in some countries are smoking more. In the United States, for example, total consumption has increased by nearly 50 percent and per capita consumption by about 32 percent. In the United Kingdom, the increases were about 40 percent in total consumption and 20 percent in per capita consumption, most of the increase having taken place prior to 1943 when prices were raised substantially. For continental Europe, where some countries have not yet regained the prewar level, consumption increased by only about 3 percent.

Even more pronounced than the increase in consumption of all tobacco products and of greater importance to United States growers has been the phenomenal increase in the consumption of cigarettes and the shift in demand from products made of dark heavy tobaccos to products made of lighter tobaccos. Cigarette consumption in Western Europe and North America combined increased from about 41 percent of the total tobacco products consumed in 1930 to about 72 percent of the total in 1950.

Part of the increase in cigarette consumption has taken place at the expense of chewing tobaccos, smoking mixtures, cigars, and other tobacco products. Per capita consumption of cigars and cigarillos decreased substantially in most countries from 1930 to 1950, and in all countries in Western Europe except Denmark where it increased slightly.

The decline in European cigar consumption was caused not only by the increased preference for cigarettes but also by reduced supplies and higher prices of cigars as a result of the shortage of cigar leaf of high quality, increased wages in the cigar industry, and a comparatively greater increase in cigar taxes since the war. Per capita consumption of smoking mixtures was also lower in most countries. Norway and Sweden, however, both showed slight gains in the use of these products.

Since the war consumers in most foreign countries have shown a decided preference for American-type cigarettes (cigarettes made of a blend of flue-cured, Burley, and oriental leaf). The shift has been most pronounced in Western Germany. Before the war about 95 percent of all cigarettes consumed in Germany contained only oriental tobacco; since the war about 95 percent have been of the blended type.

The changes in consumer preference have effected a change in the pattern of United States leaf exports. Exports of Burley leaf have increased substantially—from less than 10 million pounds a year before World War II to around 30 million pounds in recent years. And exports of flue-cured leaf, the principal export type, have increased from about 370 million pounds in prewar years to about 430 million pounds. Exports of dark, fire-cured leaf, however, are less than half those of the 1930's and only about one-fourth those of the 1920's.

The United Kingdom, which took about one-third of the total leaf exported by the United States in 1930, and slightly more than half in 1938, has taken a smaller proportion during post-war years, but is still the largest single importer of United States leaf tobacco. China, which was the second most important foreign outlet for many years prior to World War II, has been a market for very little United States leaf since 1949. Australia and France took substantially smaller quantities

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than the United Kingdom and China but were the next most important markets in the 1930's. During this period many countries, including Germany, imported some United States tobacco. Since the war, most of these countries have increased their takings of United States leaf, particularly of the cigarette types.

The changes that have taken place in the more important markets are outlined:

United Kingdom

The United States has always been an important source of leaf tobacco for United Kingdom manufacturers. In 1930, more than 85 percent of total leaf imported by United Kingdom manufacturers came from the United States, practically all of which was flue-cured leaf. At that time cigarettes made up about two-thirds of the total tobacco products consumed in the United Kingdom and most of the cigarettes contained only Virginia leaf imported from the United States. (This is the type commonly known as flue-cured or bright flue-cured.) Smoking mixtures containing a high percentage of United States flue-cured leaf made up most of the remainder.

During the early 1930's British Empire countries began increasing production of flue-cured tobacco, and as the production increased the United Kingdom manufacturers increased their takings from those sources. By 1938, United States flue-cured leaf represented only about 75 percent of the total leaf used in the United Kingdom. Most of the remaining 25 percent was flue-cured leaf of Empire origin. During the war years, the United States proportion of the total returned to around 85 percent, largely because of the shipping difficulties that retarded imports of leaf from other sources.

During the postwar years production of flue-cured leaf in the British Commonwealth continued to increase and the United Kingdom has been taking a substantial part of the surplus production of these countries. More recently, Italy, too, has stepped up production of flue-cured tobacco, and the United Kingdom, as well as other European countries, is taking a part of the surplus flue-cured leaf.

While total consumption of tobacco products in the United Kingdom is now higher than in prewar years, the total increase in usings has not been so great as the increase in usings of Commonwealth leaf. Usings of United States flue-cured

leaf have, therefore, been reduced. In fact, United States flue-cured leaf represented only about half of the total leaf used in 1952.

China

During the prewar years, China was second only to the United Kingdom in imports of United States flue-cured leaf—the only type of United States leaf imported by China in any significant quantities. During the period 1935-39 China took slightly more than 10 percent of all United States flue-cured tobacco exports. In addition, China was one of the most important outlets for United States stems, trimmings, and scrap.

In the years immediately following World War II China again took substantial quantities of United States flue-cured leaf, as well as stems and scrap. However, since the Communist party came into power on the Chinese mainland, exports of United States flue-cured leaf and stems to that country have practically ceased.

Germany

During the early 1930's, cigars, cigarettes, and smoking mixtures each represented 30 to 35 percent of the total tobacco products consumed in Germany. During most years, cigars held first place and smoking mixtures were in second place. Domestically produced leaf supplied about 20 percent of the total leaf requirements and the balance was imported from southeastern Europe, the Netherlands East Indies (now Indonesia), Latin America, and the United States.

Leaf imported from Bulgaria, Greece, and Turkey was used principally in the manufacture of cigarettes; leaf from the Netherlands East Indies and Latin America mostly in cigars; and leaf from the United States mostly for making smoking mixtures.

At the end of World War II, supplies of all types of leaf tobacco, including domestically produced leaf, were very low. In addition to the shortage of leaf supplies, the industry was faced with the job of rebuilding plants and repairing machinery used in the manufacture of tobacco products—especially cigarettes and smoking mixtures.

During the interim between the end of the war and the rehabilitation of the tobacco manufacturing industry, supplies of tobacco products were small and a substantial part of the products consumed were obtained through black market transactions.

When the tobacco manufacturing industry was able to resume fairly normal operations in late 1948 and early 1949, it found that cigarettes were preferred by about half of the tobacco users instead of 30 to 35 percent as in prewar days, and that the cigarettes in demand were the American type instead of the oriental type.

As a result of these developments, Western Germany has imported substantial quantities of United States leaf during the past 4 years. In fact, Western Germany is now second only to the United Kingdom as an importer of United States flue-cured leaf, and it is the largest importer of United States Burley and cigar leaf.

The Netherlands

For several decades prior to World War II the rate of consumption of tobacco products in the Netherlands was substantially higher than in any other European country. In fact, during most of that period, the per capita consumption was about the same as that of the United States.

In 1930, smoking mixtures represented slightly more than half of the total tobacco products consumed, cigarettes about 16 percent of the total, and cigars the remainder—about 30 percent.

During the early 1930's, from 15 to 20 percent of the leaf used by Netherlands manufacturers was imported from the United States. The balance was imported largely from Latin America, Netherlands East Indies, and southeastern Europe. Imports from the United States, which were the flue-cured, fire-cured, and Maryland types, were used largely in smoking mixtures. Some of the flue-cured and Maryland leaf was also used in cigarettes. Oriental leaf, most of which was imported from Greece and Bulgaria, was used almost exclusively in cigarettes. Other imported tobaccos were used for making cigars and smoking mixtures.

During the middle and late 1930's, the consumer preference for tobacco products made of a lighter type leaf became more pronounced, and this trend was accelerated immediately following the end of World War II.



Tobacco is prepared for the curing barns on a farm near Apex, N. C. One-third of the flue-cured tobacco produced on American farms is sold abroad.

By 1950, cigarettes represented about 30 percent of the total tobacco products consumed. Straight Virginia and, to a lesser extent, American-type blended cigarettes were in demand; only about 2 percent of the total cigarettes consumed were made of straight oriental leaf. Smoking mixtures represented slightly less than half of the total consumed and also contained substantial quantities of United States flue-cured as well as Burley leaf. Cigars represented only about 20 percent of the total consumption.

As a result the Netherlands is using much more United States leaf than at any time before the end of the war.

France

For many years before World War II France was the most important foreign user of United States fire-cured leaf.

Domestic production of dark tobaccos increased in Western Europe in the 1930's and again immediately following World War II. This higher rate of production, together with the increase in consumer preference for products made of lighter tobaccos, has caused a substantial reduction in the shipment of fire-cured leaf to France, as well as other Western European countries.

During the past 2 or 3 years France has increased its imports of United States flue-cured and Burley leaf, however, and is using these tobaccos in American-type blended cigarettes. Although the amounts imported are relatively small, they indicate a trend in consumer preference which, if permitted to continue, may lead to a substantial market for American-type blended cigarettes and, consequently, flue-cured and Burley tobaccos.

Switzerland

Switzerland, for many years, has been an important market for United States leaf tobacco, particularly that grown in Maryland. At the present time, about two-thirds of the total Maryland leaf exported goes to Switzerland. One of the brands of cigarettes manufactured in Switzerland carries the trade name "Maryland." In recent years, exports of Maryland tobacco to Switzerland have been substantially larger than in prewar years.

Switzerland is also an important user of United States fire-cured tobacco. In fact, Switzerland is one of the few countries that has taken as much, or more, United States fire-cured leaf in the post-war years as before the war. Since World War II,

Switzerland has also taken substantially more United States flue-cured tobacco.

Other Countries

Many other foreign countries are using substantially larger quantities of United States-produced cigarette tobaccos than ever before. Austria, Denmark, Belgium, Norway, and Sweden, like Western Germany and the Netherlands, are importing more United States leaf for American-type blended cigarettes. Ireland, Australia, and New Zealand continue to use mostly cigarettes made of straight flue-cured leaf. In the Philippines the cigarette manufacturing industry, which is based largely on the production of American-type blended cigarettes, is being enlarged and modernized. In Japan there is an increased demand for American-type cigarettes, and in the more expensive cigarettes United States flue-cured leaf is being added to domestically produced leaf.



Stacking tobacco for fermentation in a South African co-operative. South Africa and other countries of the British Commonwealth have been exporting more and more flue-cured tobacco during the past two decades to the United Kingdom, the most important market for U. S. leaf.

Libyan Wools Primed For the World Market

By WARNER BUCK

Libyan carpet wools represent a rather small part of the world carpet wool trade, but they are vitally important to the economic stability of the new North African desert kingdom of Libya. Increased value and marketability of such wools, which are imported in relatively large amounts by the United States and certain European countries, mean more income for Libyans—more milk and dates, and more products of industrial nations.

Increasing the value and marketability of Libyan wools is an agricultural project that stands in the front ranks of United States technical cooperation in Libya. Two conditions justify this emphasis on wool marketing: The major importance of wool exports to the Libyan economy and the inferior condition in which the native wools have been offered for sale.

Poor preparation of Libyan wool has, even in the postwar periods of strong demand, resulted in low bids from foreign buyers, bids that were no higher than the cost of production and handling. Obviously, this situation had to be corrected if the economic strength of the newly independent North African nation was to be developed. And today steps to correct it are being taken by the Libyan Government, with the technical cooperation supplied by the United States, through Point Four, and the United Nations.

One of the first steps was the sorting and packaging demonstrations recently completed in the Province of Cyrenaica at Benghazi and Derna under Point Four guidance. They introduced an entirely new idea in wool handling, and already have materially raised the name and price of Cyrenaican wools abroad. Buyers from the principal wool markets of the world are making bids on Cyrenaican wool—and doing so with the feeling that it is “packed honest.”

During the past marketing season nearly 2 million pounds of wool passed over the sorting tables at Benghazi and Derna. With the help of American technicians the wool was sorted by color, extraneous materials were removed, and some “finer edge” wools (medium grade) were taken from the predominating carpet wool types. The breakdown of the sorting operation and the disposition by actual weight were as follows:

Carpet wool:	Pounds
White	1,245,864
Colored	132,420
Light grey.....	112,404
Black	35,767
Cleaned but not sorted.....	67,570
“Finer edge” (medium grade).....	16,656
Pieces and locks.....	19,338
Wool tying yarns.....	28,952
Extraneous material and losses	
in sorting.....	118,463
Total received.....	1,777,434
Exports from Cyrenaica (in	
approximately 285-pound bales)...	6,162

Libya, which lies in the saddle of Africa, is the largest independent nation in that continent. Under United Nations sponsorship, Libya, late in 1951, became a democratic kingdom, headed by King Idris el Awal, of the Senussi sect of Cyrenaica, a family prominent for the last century. Largest of the former Italian colonies, Libya now embraces the Provinces of Tripolitania in the west, Cyrenaica in the east, and the Fezzan in the south.

The country is roughly one-fourth the size of the United States, but more than 90 percent of it is desert and much of the remainder is useful only for nomadic grazing. Thus it is that sheep—and wool—hold a high place in the agricultural economy.

The native sheep, largely of the fat-tailed Barbary breed, are well adapted to withstand the rigors of the desert. They are capable of long treks, can find nourishment on very poor range, and need to be watered only during the dry season and then only every other day. They are of moderately high quality; some improvement is possible, chiefly through selection of the better indigenous breeding stock.

In Tripolitania most of the wool produced is used locally in the weaving of barracans, the principal native garment, and in the manufacture of carpets. One of the principal aims of the improved marketing system is to sort out all fleeces that can be used for finer garments; these fleeces can be marketed at prices consistent with their value; the finer garments, too, will command higher prices.

In Cyrenaica, nearly 80 percent of the wool

Mr. Buck is a wool marketing specialist, Point Four, American Legation, Tripoli, Libya.



Libya's Minister of Agriculture is highly interested in the carpet wool grading school conducted by Point Four at Cyrenaica. Carpet wools are Libya's principal export product.

production is exported, and thus it is in this Province that the demonstrations on sorting and grading have until now been carried out. The Cyrenaican wools have a higher proportion of better grade wools than those of Tripolitania, but the production of both areas has in the past received uniformly bad preparation for market.

Some fleeces were marketed untied, while others were tied with sisal twine, cotton string, pieces of cloth, and, in a few instances, wire. Most of the fleeces, however, were tied by the wool itself, twisted in a ropelike fashion and wrapped about the fleece. By and large, the fleeces carried excessive amounts of tags and heavy dung. Little or no

attention was paid to sorting the vari-colored fleeces and removing gray and black wool from the white.

To make orderly such haphazard methods, the technical aid program has first shown on a pilot scale that better handling of wool will bring good results, and then combined local instruction with an expanded effort to grade and sort all Cyrenaican wools prior to export. Perhaps the culmination of the program was the ruling made in July 1952 by the Trade and Supply Department of the Government of Cyrenaica requiring that all exported wool bear certification that it had been properly graded and sorted under the improvement program.

During the past marketing season the center of the wool sorting operation was established at Benghazi, seat of the government in Cyrenaica, and joint capital, with Tripoli, of Libya. In order to simplify wool handling, a branch sorting center was later opened at Derna. These centers were not only busy wool sorting stations, they were also training schools for 10 Libyan trainees and a half dozen additional assistants under the agreement. The costs of this instruction were borne largely by the Libyan Government.

The training aspects of the wool marketing improvement program have been emphasized from the beginning as have efforts to make the improvements an integral part of the existing marketing system. Libyan merchants have been encouraged to visit the technicians at work and observe the sorting and grading operation. And they have been highly interested; at Benghazi, they arranged

through the Chamber of Commerce to have secondary school students work closely with the technicians in the preliminary sorting tests made in 1951. This direct liaison between the technical improvement programs and Libyan businessmen resulted last season in the employment of 30 student sorters under the LATAS (Libyan-American Technical Assistance Service—Point Four in Libya) agreement.

To carry through a comprehensive wool marketing improvement program, it will be necessary of course to extend the sorting operations to Tripolitania; this will be done as soon as enough personnel have been trained. In addition, it is considered necessary to add instruction in the scouring and washing of wools, a process that would increase local industrial opportunities and cut down on shipping costs.

Before the benefits of a Libyan wool improvement program can be equitably shared by all segments of the industry, additional changes will have to be brought about in the marketing pattern. As the system operates now, wool is purchased by buyers on a fleece count basis, rather than by weight, from farmers and desert tribesmen. If these producers are to benefit fully from the improvement program, their wool should be handled by producer cooperatives. It could then be collected at interior stations of the co-ops in lots of, say, 20,000 pounds, which could be moved to a central point for sorting, grading, etc. Producers might also get from the cooperatives technical guidance in shearing and first handling.

Under the comprehensive wool marketing improvement program, local efforts to establish official standards and grades similar to those in other parts of the world will be encouraged. Because of the great irregularity of fiber distribution of the Libyan wools, determination of spinning counts is not now considered possible, but when the wool has been improved, counts might be established.

Finally a comprehensive program calls for certain mechanical improvements in wool handling, for instance, the substitution of modern wool presses for the crude hand equipment now in use and the introduction of power shearing machines. Both would contribute greatly to more efficient handling of the wool and would help maintain its native quality. Such advances appear desirable and feasible in light of the current progress in Libyan agricultural improvement.



A flock of Barbary sheep forages on a hillside in Tripolitania. Barbary is a breed common in Libya and well adapted to desert conditions.

Thai Silk



Nong Khai silk station, northeastern Thailand. Eggs produced by moths from these cocoons go to farmers.



Picking mulberry leaves to feed the silk worms is a daily task of the silk producer.



Silk worms spend 3 to 4 days spinning their cocoons on trays like the one at the back. Completed cocoons are shown in the foreground.



Reeling raw silk thread in a Thai village home. Cocoons are immersed in warm water until they are soft and the thread can be reeled off in a single piece.



Thailand's silk fabrics find a ready market at home and abroad.

Land Reform in India

by CLARENCE E. PIKE



Land reform in India has many profound social, economic, and political implications, which vary greatly from State to State and even from district to district within States. The driving forces behind the land reform movements now under way throughout India are largely political and social; only secondary consideration is being given to the over-all economic implications.

The primary objective of most legislation on the subject is to obtain social justice, and at the same time to promote political stability, by satisfying the land hunger of the villagers or at least by banning excessive rent. But satisfying the land hunger is not everywhere compatible with the country's economic needs. To follow a course in opposition to the desires of a vast majority of the people, however, is likely to lead to political instability, which would be detrimental to economic progress. Thus, the question of the proper course to follow becomes particularly vexing in India, where much of the population is already at a bare subsistence level.

Land hunger among India's rural masses is undoubtedly great, and dissatisfaction with the status quo has grown in recent years. The Government of India and most, if not all, of the State governments are aware that land reform is one of their greatest, most urgent problems. It is generally known that until a satisfactory solution to the land problem is found progress along many other lines may be slow and political stability threatened.

Being aware of the many complex problems involved the Government of India in 1952 requested the assistance of two of America's leading land reform experts, Mr. Wolf I. Ladejinsky, Agricultural Attache, American Embassy, Tokyo, Japan, and Dr. Kenneth W. Parsons, Professor of Agricultural Economics, University of Wisconsin. Each of these experts spent several months in India during the latter half of 1952 studying land reform problems and legislation during the formulation of the land reform recommendations that the government Planning Commission made in India's Five Year Plan, presented to Parliament late in 1952.

Some of the principal land reform proposals in the Five-Year Plan are: (1) to conduct a census of

land holdings and cultivation in 1953 in all States to provide a statistical basis for forming land reform programs and legislation, (2) to perfect official arrangements in the various States for administering ex-zamindari areas (zamindars are persons who hold heritable rights to collect rents and pay land revenue to the government), (3) to have all States place an upper limit on the amount of land that an individual may own, (4) to get under way in every State a program for the consolidation of fragmented and scattered holdings, (5) to aid and encourage co-operative farming, (6) to provide for security of tenure, (7) to fix ceiling rental rates generally not to exceed one-fourth of the gross produce, (8) to aid and encourage the movement for gifts of land to the landless, (9) to provide additional employment opportunities for landless laborers, and (10) to establish a central land reform organization to be concerned with the evaluation of land reform programs, investigations into land problems, etc.

Figures from the 1951 census of India serve to emphasize the magnitude of the problem of satisfying the land hunger of the villagers. The census reveals that the agricultural population represented 70 percent of the total population. There were 167.3 million cultivators (including dependents) who either own or have permanent occupancy rights to all or most of the land they till, 5.2 million non-cultivating owners (including dependents), 44.7 million landless agricultural laborers (including dependents), and 31.5 million tenants (including dependents) who own little or none of the land they till. The latter two groups, which total 76.2 million persons who live and work on the land without any sense of ownership and have few material possessions, make up the class that constitutes the greatest problem.

Most writers on the subject in India express the view that land must be found for these people if political stability and economic progress are to be achieved. However, some recognition is given to the fact that providing land for the now landless agricultural population will in general result in

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further fragmentation of the land into uneconomic holdings, since India's 266 million acres of cropland is already divided among about 40 million cultivating owners and tenant families.

The vast majority of those without land are anxious to become full owners of at least a few acres of tillable land. Only among the occupancy tenant group in some areas, notably Uttar Pradesh, are there those who do not wish to purchase full-ownership rights even when they are financially able to do so. Such tenants now pay a low fixed cash rent and have permanent and heritable occupancy rights. In fact, the 1951 census classifies permanent occupiers with owners. In Uttar Pradesh one of the reasons why few tenants have exercised their right to buy their farms by payment of 10 years' rent is that the local rate of interest on the purchase price is more than the rent.

These exceptions do not alter the fact that the majority of cultivators desire to own the land they till, but they are financially unable to do so. This is especially true in the share renting areas, where the share rents are 50 to 75 percent of the crop. For this group the best alternative to outright ownership seems to be permanent occupancy with rents fixed at a low rate.

Land reform programs have been under way in a number of Indian States for several years and in some for at least a century. And within the past 3 or 4 years new legislation has been passed in at least 15 States. Although the degree of progress, like the conditions of land ownership and tenancy, varies widely from State to State, the pattern of progress has been about the same. The passing of land reform legislation usually moves ahead rapidly. Full implementation, however, is normally slow.

Slowness in implementing land reform legislation and policies and consequent unrest among tenants and landless laborers have led to some, but not widespread, violence in a few States in India.

There are several reasons for the slow over-all rate of progress of the land reform program, among which are: (1) the heavy pressure of population on the land, which makes a really satisfactory solution of the land problem practically impossible as long as this situation exists, (2) the low income of Indian peasants, which makes it impossible for many of them to purchase ownership rights in the land they till even where this is legally encouraged, (3) the complicated pattern of rights in land, which exists in the various States of India, (4) uncertainty

among legislators and government officials as to the correct solution to land problems, (5) the paucity of trained officials for administering land reform laws, (6) organized opposition on the part of landlords to measures adversely affecting their interest, (7) opposition on the part of peasants to certain reform measures such as the consolidation of fragmented holdings, (8) India's legal structure, which is designed to protect the rights of individual ownership, and (9) the financial problem of State compensation for land taken from the zamindars and jagirdars.

The problem of land reform in India is complicated by the fact that the desires of the rural masses do not always coincide with the most desirable economic program for the country.

One of India's most pressing economic needs is to increase the country's food production, and generally the larger farms have the highest yields per acre. Although large farms make up only a very small proportion of the total, to fragment them would probably lead to some decline in the country's over-all food production. Consolidation, not fragmentation, is needed for increasing production. The government recognizes this fact and consequently is advocating consolidation of small holdings into cooperative farms. Such farms permit more efficient use of labor-saving machinery such as tractors and encourage the use of improved practices. However, although cooperative farming would probably maintain and possibly somewhat increase the cooperative cultivators' income, it would almost certainly lead to further underemployment in rural areas.

Economically, politically, and socially the only real solution to the unrest and land hunger of India's villagers is greatly increased opportunities for nonagricultural employment to draw away from the farms the many millions of unemployed and underemployed for whom there is no conceivable way to provide sufficient land worth cultivating. If this could be accomplished it would provide more goods and services for the country and at the same time provide greater opportunities for improvements in agriculture. However, progress along these lines will be slow and it will take many years to show substantial gains. In the meantime if political stability is to be maintained and strengthened and the status of India's rural masses improved, the various States must move forward with vigorous land reform programs.

Better Livestock in Denmark By Progeny Testing

by RALPH S. YOHE



Denmark has long been known for its fine livestock and livestock products. It is a small country—barely large enough to fill Lake Michigan—but it produces enough livestock and poultry products to feed its more than 4 million people and has enough left over to export to Great Britain, Germany, and other nations of Europe. Danish butter, cheese, bacon, and eggs enjoy a reputation for quality in world markets and are among the most important profit makers for Danish farmers. These and other agricultural products make up about two-thirds of Denmark's income from exports.

Each Danish farm is virtually a livestock factory. In order to put butter, cheese, meat, and eggs on the world market at a competitive price and still make a profit Danish farmers must have cows, pigs, and hens that are highly efficient at turning grains, imported oilcakes, and farm-produced grass and roots into high quality livestock and poultry products. And Danish livestock and poultry have been bred to do just that.

Progeny testing was started in Denmark in 1900. The records of milk cows were compared with those of their mothers at the same age. By 1941 there were individual records on more than 16 million cows and by that time some 400 bulls were being tested each year.

Since most of the Danish farms are small, milk cows are kept in small herds. Most herds will run from a few head up to 30 or 40 cows. So it is almost impossible for every farmer to keep a good bull. For many years bull clubs were the Danish farmers' answer to the problem. A group of farmers in a community would buy a bull together. One farmer would be designated to keep the bull. The other farmers would bring their cows to breed to it.

It was only natural that Denmark should be one of the first countries to use artificial insemination among its dairy herds. It was started in 1936. Last year about 65 percent of all the cattle in Denmark

were artificially bred. That compares with somewhat less than 20 percent of the dairy cattle in our own country.

Artificial insemination has paid off in Denmark. The use of progeny tested bulls, teamed up with good care and management, has boosted average milk production in Denmark to well over 7,500 pounds of milk per cow. In the United States the average is around 5,000 pounds.

The testing of bulls in artificial insemination rings in Denmark was an outgrowth of the war-time experience of dairymen in the country. Some of the imported feed, particularly oilcakes, were cut off during the war. Even following the war, many feeds were hard to get. Farmers had to feed the cows the best they could with whatever was available. This led the Danish farmers to wonder if a comparison of the daughters to their mothers was as accurate a record as it should be. They decided that there should be a better way of directly comparing the production of the bulls' daughters. In 1945 three bull testing stations were established to test bulls in artificial insemination rings.

The results were good enough and the interest high enough among dairymen that the number of stations was continually increased until now there will soon be 18 stations in all.

One testing station I visited is located on the island of Zealand. Zealand with its rolling hills and red-tile and thatch-roofed farmsteads is the main island of Denmark. The station is operated by the Kaerehave agricultural school. The buildings for livestock are about the same design as those on Danish farms, and the feeding and other practices are similar to farm conditions. It is felt that they should be, since the true worth of the bulls' daughters must be proved on the Danish farms themselves if the program is to be satisfactory. The school furnishes the feed and the labor and in return receives the income from the milk.

Mr. Yohe, Science Editor, *Prairie Farmer*, Chicago, Ill., spent several weeks in Western Europe last summer.

As we walked through the barn, the superintendent of the school explained just how progeny testing works in Denmark. The breed cooperatives who own the bulls must pay for transportation of the heifers from the farms to the progeny testing stations and back again. The breed associations pay each farmer who has a heifer in the test a certain fee for the use of the heifer.

The object is to get 20 heifers from 20 different farms all bred to the same bull. An attempt is made to select the heifers from cows with about the same average production as the cows on the farms where the semen of the bull would normally be used.

The heifers arrive at the station about the first of September. They must drop their first calf between October 1 and November 15, when they are from 27 to 33 months of age. The feed is identical in all of the stations and the heifers are fed according to the Danish feeding standard. As near as possible even the quantity and quality of the grass fed is the same. All the heifers are milked at the same time of day.

At Kaerehave there were some 60 heifers under test representing the progeny from 3 bulls. Altogether in Denmark last year 48 bulls were tested—39 Red Danes, 5 Danish Black and Whites, 3 Jerseys, and 1 Shorthorn; this ratio is representative of the population of each breed in Denmark.

All records are based on the total milk and butterfat the heifers give on twice-a-day milking for 305 days.

"Not only is the comparison of the bulls' progeny more accurate than under the old system of comparing daughters with dams on many different farms, but it also gives us fairly accurate records by the time the bull is about 5½ years old," the superintendent told me. "You see, it is very important that we have as accurate a comparison as possible on bulls in artificial insemination rings since today more than half of the calves dropped in Denmark are from cows artificially bred. Calves sired by bulls with low daughter production can be sold early. That way the farmer does not have the expense of raising them and feeding them through the first lactation. Of course we also have records comparing the daughters with their mothers. This is an additional tool in selection."

I had already visited a swine testing station, one of five such stations located in various parts of Denmark.

These swine progeny testing stations have a long history in Denmark. Danish Landrace and Large Yorkshire litter tests were started in 1899. Today, Danish Landrace is the breed supreme in Denmark. There are 269 swine breeding centers in Denmark. All but 4 have Landrace.

Here is how the litters are tested. Four litter mates, two gilts and two boars, randomly selected, are sent to the station and each pig is placed in a separate pen. The pens are spotted across the building so that no litter will have any advantage in location. The Zealand station that I visited had 400 pigs under test out of 100 litters from 90 dif-



Red Danes are the most popular dairy cattle in Denmark. Progeny testing has gone a long way toward making the breed one of the world's highest milk producers.

ferent breeders. The pigs come to the station at weaning time. Records are started when they weigh 44 pounds.

These stations have been encouraged and supported by the Danish cooperative bacon packing companies. Since the packing companies are owned by the farmers themselves and furnish high quality bacon for the export market, they have been very interested in raising the best carcasses possible. The farmers, of course, are interested in growing the pigs on the least amount of feed. In the stations the pigs are fed identically on barley and skim milk, since this is the standard ration on most Danish farms. It is also the one ration that is always available to Danish farmers.

The test ends and the pigs are butchered when they weigh about 200 pounds. The feed to each pig is carefully weighed, the carcasses scored for dressing percentage, quality of bacon, body length, and thickness of back and belly fat. Tests are given for texture and distribution of the back fat, size of shoulder, thickness and quality of the loin, form and size of the ham, fineness of skin and bone, and the amount of lean meat in comparison with fat and bone. The results have been remarkable.

In 1910 it took 4.5 pounds of skim milk and 3 pounds of barley to produce a pound of pork. Today a pound of pork can be produced on just a trifle over 3.6 pounds of skim milk and 2.4 pounds of barley. Since 1926 the average length of all carcasses in the test has increased $1\frac{3}{4}$ inches. The thickness of back fat has been cut down on the average a quarter of an inch and the eye of loin increased nearly a quarter of an inch. Of course, outstanding litters have increased much more than these averages.

The important thing, the Danish hogmen told me, is to produce as economically as possible a carcass that has heavy expensive cuts and light inexpensive cuts.

"You may think the Danish pigs look rather tapering," one Danish hogman told me, "and that's right. They are. For years we used to put pigs in the shows that had a uniform width. But in our tests we have found that those that taper from front to rear have light forequarters and heavy hind-quarters. We get more money for heavy hind-quarters."

"Does it pay to test your litters?" I asked one Danish swine breeder.

"Definitely," was the answer. "The price for



This Danish Landrace gilt is typical of the breed—long, smooth, heavy loined, and deep hammed. Progeny testing stations are an important part of the breeding program to produce this type of pig for the export market.

boars from a tested litter is \$20 to \$50 higher. But what is more important, our own pigs reach market weight faster and more economically. Then, too, Danish bacon sells at a high price on the world market because of its quality. And that is very important if the Danish hog farmer wants to keep in business."

"But this testing program must cost a tremendous amount of money," I said to a superintendent.

"Not at all," he told me. "Except for the small amounts paid out by the breed associations and the bacon factories to the farmers themselves, the sale of milk and bacon pays for the entire testing program. And what is perhaps equally important, the program is directed by the breeders themselves."

Even the egg laying contests are run on a progeny basis. That is, the birds of each pen must be sired by the same cockerel.

Of course, we could find flaws with the Danish progeny testing program. The Danes themselves would freely admit that it would be better if they had larger numbers from each sire, larger numbers of pigs from each litter. That would increase the accuracy of the test. Then, too, it would be better if all of the stock were raised under the same conditions before they go to the test.

Nevertheless, the Danish progeny testing program is a most useful and practical yardstick in comparing the worth of sires owned by various breeders and breeding centers. And it is an important tool in producing efficient livestock and in keeping the high reputation that Danish cheese, butter, bacon, and eggs enjoy in many countries.

Agricultural Research

And the Point Four Program

By ROY C. DAWSON and GLEN BRIGGS

County agents and extension and information specialists are being called upon to go out into the world and put into practice the principles that have made the United States outstanding in agricultural production. Reports from abroad indicate that these specialists are making great progress in many places. Greater progress is expected to come as they apply improved methods and techniques. And no doubt it will come. But the methods and techniques must be based on facts, facts that have been tested under local conditions and compared with accepted standards of performance. This calls for applied research.

Applied research has been defined as "a search for new knowledge to be immediately applied to the solution of a specific problem." Applied research must be done by those who are aware of the importance of eliminating, as far as possible, personal bias and preconceived notions. It must be done with an open mind and a willingness, within limits of feasibility, to make necessary changes. It must be done under conditions that are similar to those in the field of actual application.

It is to research carried out in this manner that extension specialists can look for their facts.

For lack of tested facts, many projects have failed. An outstanding example, still fresh in our minds, is the African groundnut project. It was an attempt by the British Government to produce groundnuts (peanuts) in East Africa on a large scale. Failure resulted because of insufficient knowledge of soil and climatic factors.

Other examples are to be found in some of the irrigation projects of the past, which ended with abandoned and ruined saline soils incapable of producing crops. The initial demonstrations looked promising. Too late, it was discovered that the practice would unbalance soil-water-plant relationships. The demonstrators did not have adequate facts to guide them properly. Hot climate, wet and dry seasons with heavy evaporation, lack of proper drainage, and soil not suited to irrigation without

proper precautions ruined an excellent project. A little applied research before and during the demonstration to make facts available might have paved the way for a successful operation.

We cannot afford to take such risks with our technical assistance projects. Applied research must be relied upon as a necessary part of agricultural programs sponsored in countries receiving technical assistance, for people engaged in extension and operations work must have a reliable source from which to get their facts as well as competent assistance in solving their problems.

Improved agricultural techniques and more facts are urgently needed in many parts of the world today, especially in many densely populated areas where primitive and inefficient methods are used.

Technicians working in those areas can make many improvements in production and distribution of agricultural products by applying knowledge already accumulated. Research scientists have provided us with information that is now ready to be applied or tested under field conditions by demonstration.

But if present and future world-wide demands for agricultural products are to be met, research must be continually on the job, anticipating needs and providing the best known means of meeting the needs. It is interesting to study production trends and to note that even in the United States, with all its means of disseminating knowledge, such as the efficient extension service system, general increases in production always lag several years behind the known research results. This means the United States must maintain a large reservoir of facts about practices for crops, soils, animal production, and breeding, for it may be years before farmers accept the new research results. No country has so much research knowledge already on hand that it can afford to stop and let application catch

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up. New information and improved practices make for change, and change makes further need for research in order to make progress.

All this searching for facts and passing them on requires personnel trained in methods of conducting experimental investigations and in the interpretation of results obtained. It is encouraging to see that the technical assistance programs provide for the training in the United States of a number of research scientists from other countries. Emphasis also needs to be placed on cooperation between research, whose function is chiefly the solution of technical problems, and extension, whose dual

function is to bring problems that need solution to the attention of research and to carry research results to farmers.

Research is justified on the grounds that knowledge is a better guide to action than ignorance. It stands to reason, therefore, that from the long point of view, such as that taken by the Point Four Program, progress must lean heavily upon research. Research must supply new facts for education and extension so that technicians can feel confident in their recommendations and in the long run gain the confidence of the farmers by giving reliable technical assistance.

Fighting Bees of Bolivia

By FRANK J. SHIDELER

Wild Bolivian bees—and possibly those from some other South American countries as well—apparently consider as intruders the honeybees that have been brought into their native land. In fact, they appear to resent them so much, in Bolivia at least, that they are applying various forms of bee warfare in certain sections of the country to such an extent that it is a factor in beekeeping.

These are the initial conclusions of Señor Noel Kempff Mercado, a Bolivian farmer, and Dr. J. Alex Munro, Foreign Agricultural Service entomologist with the Servicio Agrícola Interamericano in Bolivia under the Point Four program. Señor Kempff, who is a keen observer of bees on his farm near Santa Cruz, tells of one species of the wild bees that uses a kind of “gas warfare” and of at least two others that destroy their enemies with a concentrated “blitz.”

“The honeybee is not native to the Americas,” Dr. Munro points out. “The attack by these marauding-type native wild bees against the Italian honeybees on the farm of Señor Kempff is different from the attacks by so-called ‘robber bees’ that are fairly well known elsewhere. The ‘robber bees’ are honeybees. From descriptions by Señor Kempff and from post-battle results I have seen, this type of



Beehive on the farm of Señor Kempff, Santa Cruz, Bolivia. Most of the hives for honeybees in Bolivia are made of mahogany.

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marauding bee warfare is something of entomological interest. It is the first that I have heard of in my 26 years as an entomologist."

Señor Kempff says the most dreaded attacker is a large black bee with strong jaws. He reports that the typical Italian bee casualty usually crawls from the conflict dragging its abdomen and back members and dies in a short time. The honeybees fight, too, when they are attacked but generally suffer three times as many casualties as do the marauders. Most of the attacks occur at the ends of the beeyard or at somewhat isolated colonies.

Perhaps the most interesting type of attack is that of the species using a form of "gas warfare." Señor Kempff has noted that this species squirts a pungent-smelling liquid on his Italian bees. The liquid destroys the natural odor of the honeybees; as a result the colony is thrown into confusion and often its members begin fighting among themselves.

The "shock troops" used in another kind of attack are characterized by their strength and

toughness and a sting that Señor Kempff says is strong and long enough to go through a leather glove. When they launch an attack against a honeybee colony of medium strength, they usually overpower it in a short time.

Even when man allies himself with the honeybee defenders, it is often difficult to ward off the attacks. One means of combating the large-bodied marauders is to reduce the size of the hive entrance holes. Smoke halts the attacks only temporarily.

The most successful means of counterattack is to capture alive and unhurt some of the attacking bees. Señor Kempff puts these bees into a wide-mouthed bottle that contains arsenic powder or an ant killer, and shakes it to cover the bees with the powder. Then he frees these powder-laden bees. Apparently they begin to feel the effect of the poison rather soon because they fly directly to their home. There, it is thought, they spread the poison, because after a short time the pillage against the honeybees ceases.



Beehives must be protected from the sun in Bolivia, as in other tropical countries.

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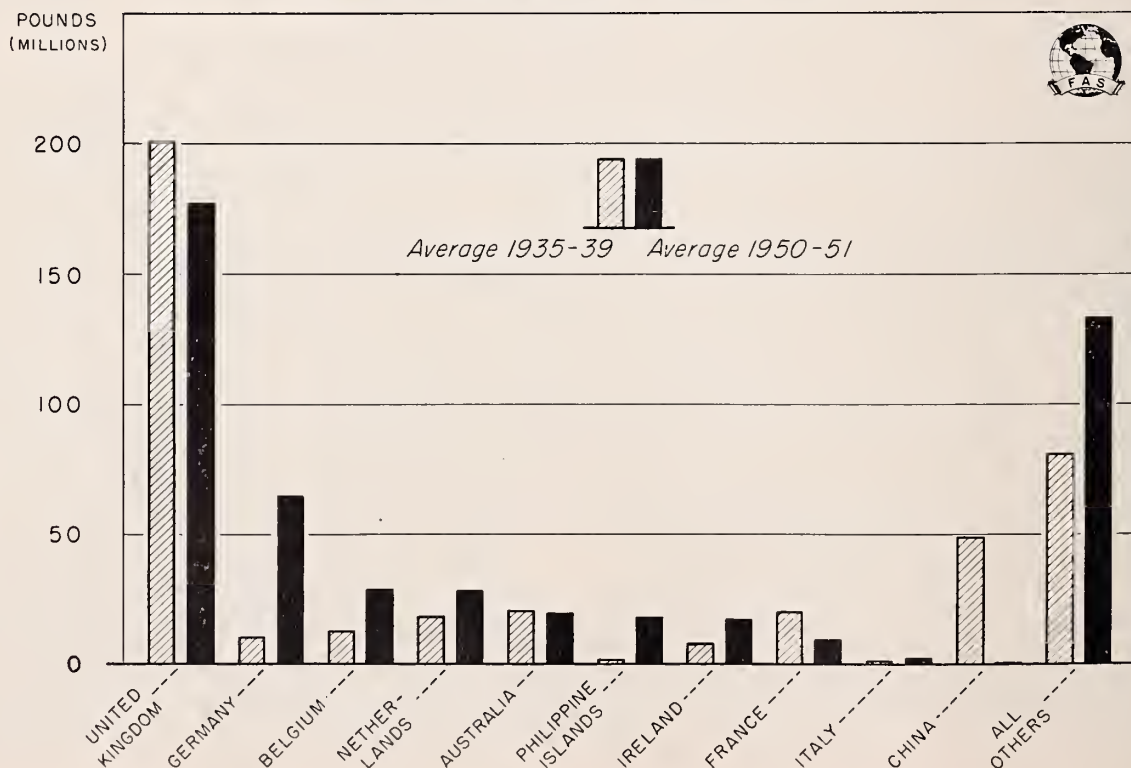
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